Unusual Sonographic Finding of Metastatic Invasive Lobular Carcinoma to the Contralateral Breast

Ji Hyun Youk, MD, Eun-Kyung Kim, MD, Gwang Il Kim, MD, Kyung Hee Ko, MD

Invasive lobular carcinoma (ILC) is the second most common breast cancer after invasive ductal carcinoma (IDC), accounting for 5% to 14% of all breast cancers.[1] Like other primary breast cancers, ILC can metastasize to a contralateral breast via lymphatic or hematogenous dissemination. However, contralateral breast cancer metastasis is a rare event. A variety of sonographic findings of metastases from extramammary malignancies have been reported,[2] but those from contralateral breast cancer are little known. We report an unusual sonographic finding of contralateral metastases of ILC in a patient with advanced breast cancer and systemic metastases.

Case Report

A 64-year-old woman came to our hospital with about a 2-year history of a palpable mass in the right breast. On physical examination, she had a poorly demarcated fixed tender mass measuring about 5 cm in diameter with erythema and thickening of overlying skin and nipple retraction. On mammography, an irregular spiculated hyperdense mass associated with diffuse trabecular thickening, skin thickening, and shrinkage of the breast was shown in the right breast. In the left breast, multiple round or oval indistinct isodense nodules were detected (Figure 1). On sonography, the palpable mass of the right breast was revealed as 2 masses abutting each other: an irregular spiculated hypoechoic mass with posterior acoustic shadowing and an echogenic halo and an oval microlobulated hypoechoic mass measuring 39 × 25 × 15 mm, highly suggesting malignancy (Figure 2A). Another

Abbreviations
IDC, invasive ductal carcinoma; ILC, invasive lobular carcinoma

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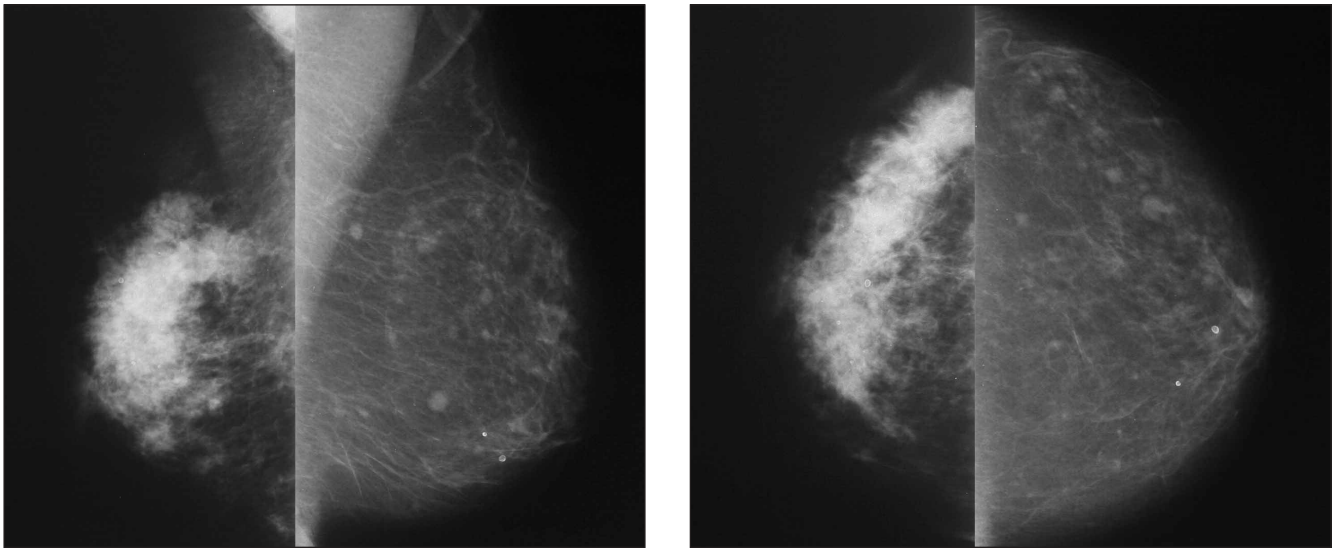
Address correspondence to Eun-Kyung Kim, MD, Department of Radiology, Yonsei University College of Medicine, Seodaemun-ku, Shinchon-dong 134, Seoul 120-752, Korea.
E-mail: ekkim@yuhs.ac



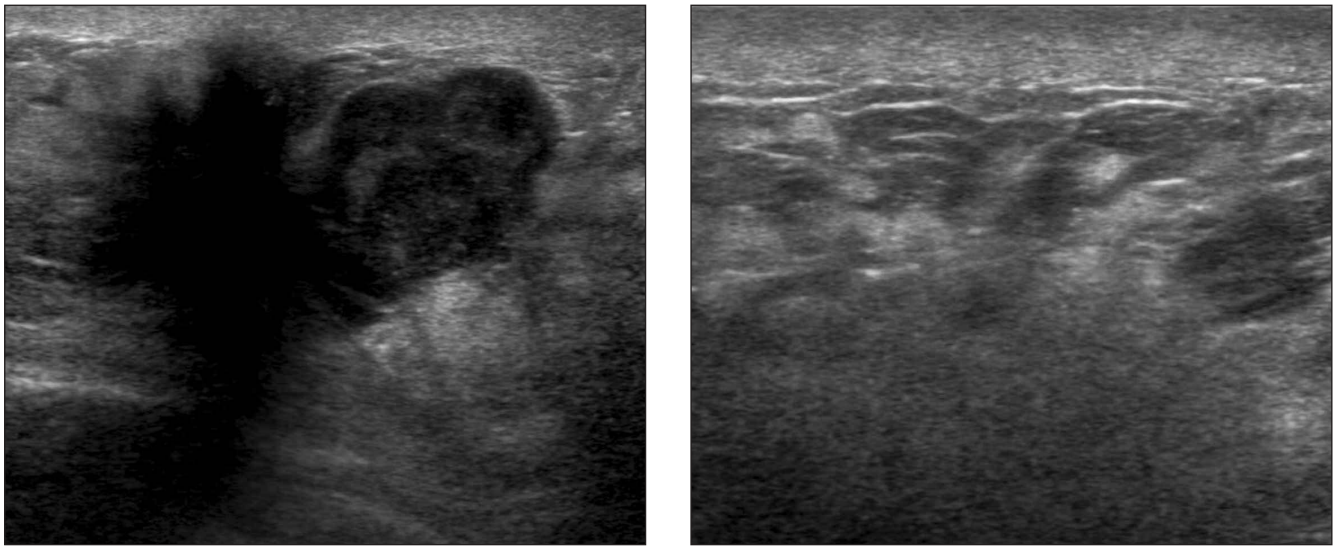
A B

Figure 1. Mammograms (**A**, mediolateral view; **B**, craniocaudal view) showing a diffusely infiltrating mass and internal suspicious microcalcification involving the whole right breast, associated with trabecular thickening and shrinkage of the right breast. In the left breast, multiple variably sized poorly defined round or oval masses are scattered.

malignant mass was also in the same quadrant. Diffuse poorly defined parenchymal hypoechogenicity with shadowing and diffuse skin thickening were also detected in the ipsilateral breast (Figure 2B). In the left breast, multiple circumscribed or poorly defined hyperechoic nodules ranging in size from 2 to 7 mm were scattered, corresponding to the nodules on mammography. Some of the hyperechoic nodules contained internal hypoechoic portions (Figure 3). Multiple malignant lymphadenopathies in the right axilla were also seen.

Figure 2. A, Sonogram of the right breast showing irregular spiculated hypoechoic masses with posterior shadowing and a round microlobulated hypoechoic mass in the upper outer portion of the breast. **B**, In the remaining parenchyma, diffuse poorly defined hypoechogenicity with posterior shadowing is shown.

A B



The patient underwent sonographically guided 14-gauge core needle biopsies of both the right palpable mass and one of the left hyperechoic nodules. The pathologic diagnosis was ILC (histologic grade 3, intermediate nuclear grade) in both breasts, and these lesions were pathologically identical (Figure 4). During the workup for systemic metastases, multiple metastatic lesions were found in pelvic bones, both lungs, and the right orbit.

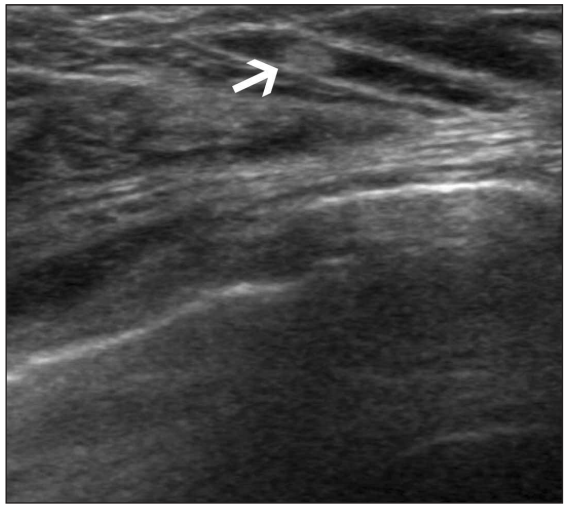
Discussion

Metastatic involvement of the breast is relatively rare, accounting for approximately 1.3% to 2.7% of all breast malignancies. Spreading of malignancy from the contralateral breast accounts for most of these metastases.[3] When cancer is detected in the contralateral breast, nevertheless, the question arises of whether this tumor is a second primary cancer or a metastatic spread from the first breast cancer. In the absence of definite histologic differences, the contralateral breast tumor is considered compatible with a second primary cancer if no clinical evidence of spreading of the first tumor across the midline, subcutaneous malignant nodules, or metastasis of the first tumor beyond the axilla is present.[4] Therefore, the contralateral lesions in this case can be considered metastases rather than synchronous cancer because the lesions showed the same histologic type and differentiation as the first tumor, and distant metastases were present in multiple organs. Metastasis of ILC to the contralateral breast is unusual, although the pattern of hematogenous metastasis from ILC is peculiar and differs from that of other breast cancers. Invasive lobular carcinoma is less likely to affect the lungs, pleura, and brain than IDC. By contrast, the peritoneum, leptomeninges, gynecologic system, and gastrointestinal system are much more likely to be involved in advanced ILC. It has been suggested that the loss of the cell-cell adhesion molecule E-cadherin is responsible for decreased adhesiveness in ILC tumor cells, thus facilitating metastasis.[1,5]

Metastasis to the breast may occur by 2 distinct routes: lymphangitic and hematogenous. Lymphangitic metastasis to the breast usually occurs across the anterior chest wall (transtho-

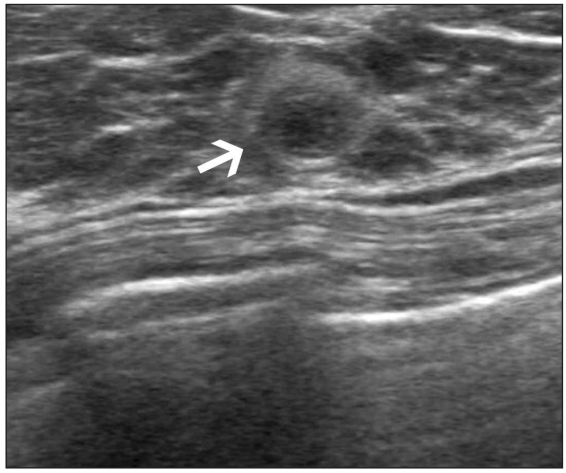
Figure 3. Sonograms of the left breast showing multifocal hyperechoic masses (arrows). Most lesions are homogeneous (**A** and **B**), but a few lesions contain hypoechoic portions (**C**).

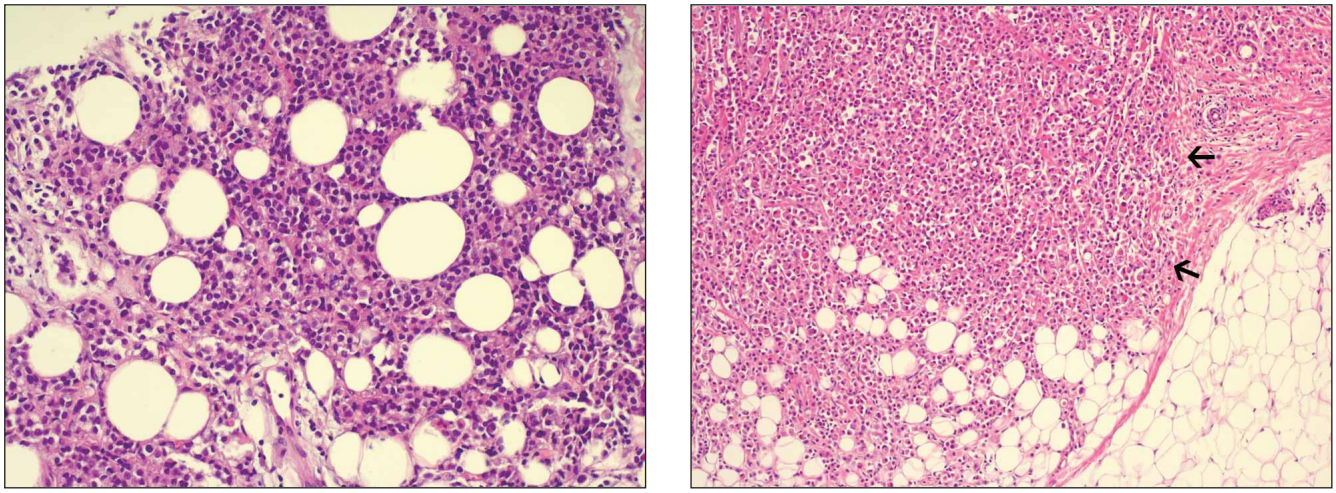
A



B

C





A B

Figure 4. A, Core biopsy specimen of the left mammary lesion. The infiltrating uniform small tumor cells form solid sheets, and they lack cellular cohesion (hematoxylin-eosin, original magnification ×200). **B**, The right-side tumor shows the same solid pattern as the left-side tumor (arrows; hematoxylin-eosin, original magnification ×100).

racic or cross-lymphatic metastasis) to the opposite breast, and the radiologic findings become indistinguishable from those of inflammatory carcinoma. Most commonly, this occurs from contralateral breast cancer.[6,7] The characteristic appearances that suggest hematogenous metastasis on mammography and sonography are small, superficially located, round or oval, circumscribed or indistinct nodules with a paucity of associated microcalcification, spiculation, or other signs of a surrounding desmoplastic reaction.[6] In this case, the metastatic lesions in the contralateral breast were shown as multiple discrete oval nodules primarily located in the subcutaneous fat layer, compatible with the findings of hematogenous metastases.

On sonography, however, the lesions showed unusual hyperechogenicity. In general, hyperechogenicity is thought to be a benign sonographic feature with a high negative predictive value for malignancy.[8] Most primary and metastatic malignancies in the breast are hypoechoic, and hyperechoic malignancies are very rare, which has been reported only in a few reports of nonmammary malignancies such as angiosarcoma and metastases from other organs.[6,8–11] Not only for nonmammary malignancies, but for breast malignancies, hyperechoic lesions have been scarcely found. Only 1 case of an oval well-circumscribed hyperechoic metastasis from contralateral breast carcinoma, without a specific diagnosis reported, was found in a review of 33 breast metastasis cases.[12] Invasive lobular carcinoma more commonly presents with echogenic components compared with other breast malignancies (10 times more often than IDC). It can show heterogeneous increased internal echogenicity but is rarely exclusively hyperechoic, as shown in this case.[13] In a study by Cawson et al,[14] the internal echo pattern of ILC was hyperechoic or had a substantial hyperechoic component in 21 cases (57%). The histologic characteristics of ILC infiltrating into surrounding tissue are suspected to cause an increase in reflective surfaces; sonographically, this translates into increased internal echoes and the echogenic components of ILC lesions.[13] Interestingly, although the bilateral ILC lesions of this case were pathologically identical, their sonographic features were quite different: the index tumors were hypoechoic masses showing typically malignant sonographic findings, but the contralateral metastases were well defined and hyperechoic.

This report describes an unusual case of hyperechoic metastases from ILC of the contralateral breast. A large number of lesions in the contralateral breast are second primary cancers rather than metastases of bilateral breast cancers, and

hyperechoic malignancies are very rare. In a case with known malignancy in one breast, however, contralateral breast metastasis should be considered in the differential diagnosis of multiple hyperechoic masses in the contralateral breast if the imaging findings are suggestive of hematogenous metastasis, especially in patients with evidence of distant metastasis.

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